PIN TYPE FORK POSITIONER WITH SHIFTING
SF-F MODEL

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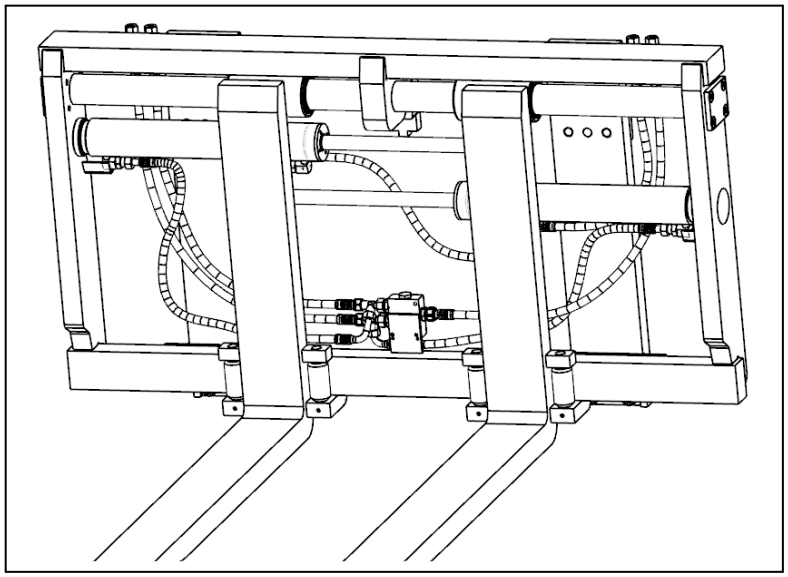


Fig.001

1 DESCRIPTION AND OPERATION

1.1 Positioner (FIG.001)

Device designed to position load forks attached to chrome bars (hardened material 42CrMo4) through a sleeve welded on the fork shoulder and driven by hydraulic cylinders.
The forks slide on INA self-lubricating bushings and are equipped with scrapers and greaser to lubricate room bushings as needed. In the bottom, the translation takes place through therollers fitted with grease nipples for lubrication
Screws and fittings' surfaces are treated to preserve them against rust.
A protective grid can be applied by means of bolts and washers (without any welding and/or drilling).
The connection of the hydraulic system has inputs positioned according to the type of the carriage strut. The connection fittings are metric threaded with 24° cone DIN 3861 (12L or 15L). The tightness of fittings for the positioning hydraulic system is performed with an O-ring and a retaining washer. The hydraulic system for forks positioning is equipped with a valve to ensure a perfect synchronism of the forks.

2 ASSEMBLY INSTRUCTIONS

2.1 Whole positioner

Mount the positioner on the carriage plate according to the specific strut instructions. Connect the system on the strut to the fittings of the equipment by tightening according to the regulations of the fittings used.

2.2 Hydraulic System (Fig.002)

2.2.1 Using flexible metal hoses equipped with end fittings, connect the system on the carriage mast to equipment fittings Q1 (opening forks), Q2 (closing forks), Q3 (shifting left), Q4 (shifting right) by tightening according to the regulations of the fittings used.

2.2.2 Perform some test manoeuvres to check for any leaks on hydraulic fittings, speed and movement synchronization of the forks. In case of oil leakage, remove the affected fittings and clean them thoroughly. The synchronism of the forks is guaranteed by the valve. For recommended oil flow and pressure, see the table at the bottom of point 4.4.

2.2.3 Perform some idle shifting movements in both directions up to the limit switch and under pressure for a few seconds. Then check the seal of the hydraulic connections. Disassemble and clean fittings in presence of any oil leaks. Tighten them according to the regulations.

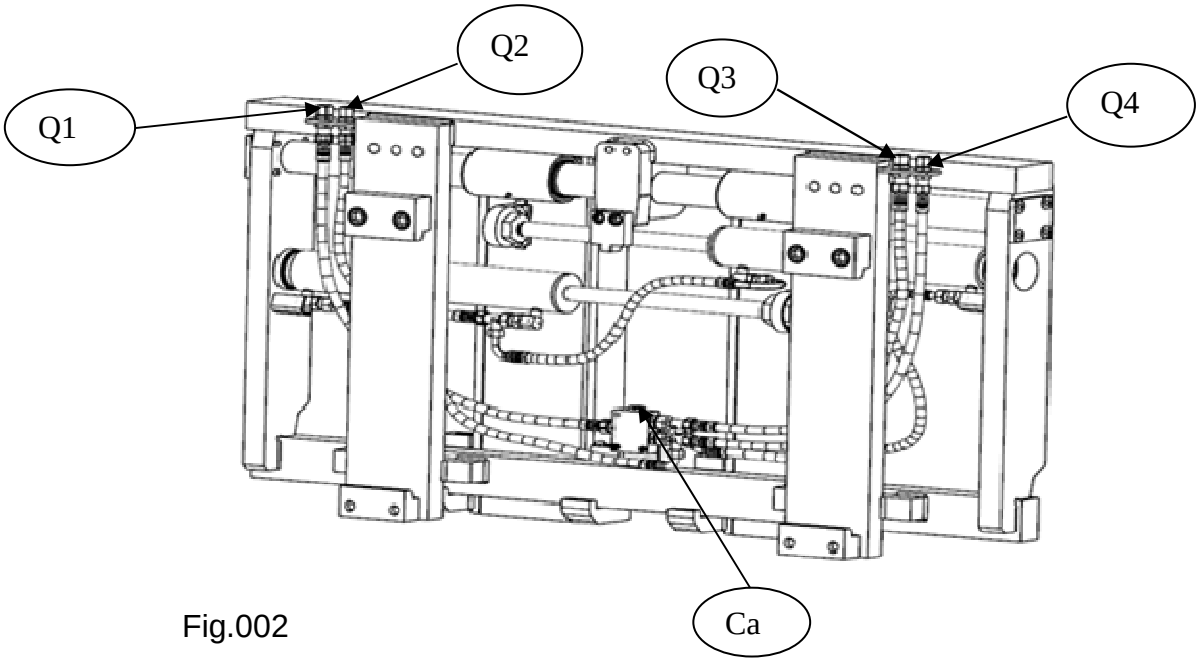


Fig.002

2.3 Mounting and dismounting forks

- Turn off the carriage, remove pressure in the supply circuit, and make sure that during the operation the pump is not activated and that the distributor lever is not operated on.

2.3.1 Secure the nut "c" with the hex wrench "a" on the drag ear and loosen the front nut "d" with the socket wrench "b". (Fig.004,Fig.005)

2.3.2 Remove the cover "X" loosening 4 M12 screws with 8 mm Allen key. (Fig.006)
2.3.3 Attach the fork support with a rope.
2.3.4 Remove the pin/shaft "Y". (Fig.006)
2.3.5 Remove the fork. (Fig.006)
2.3.6 For assembling, bring the fork support to the correct position and insert the pin/shaft "Y". (Fig.006)
2.3.7 Repeat in the opposite order the operations from step 2.3.3 to 2.3.1

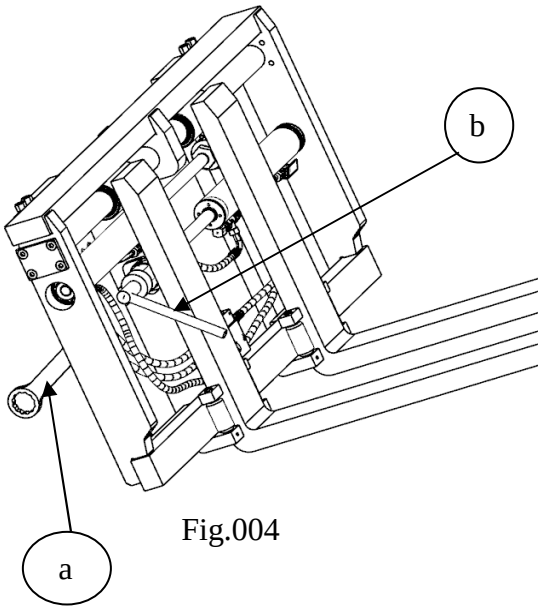


Fig.004

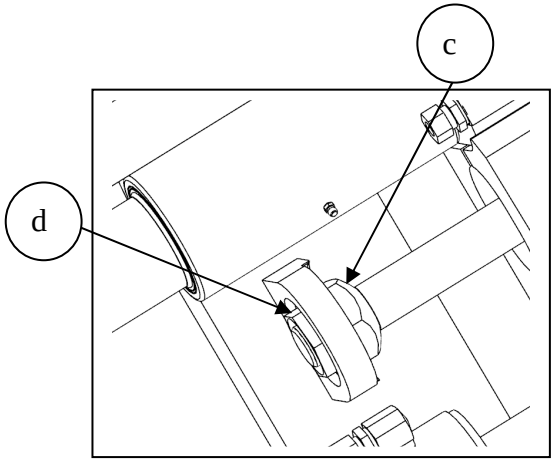


Fig.005

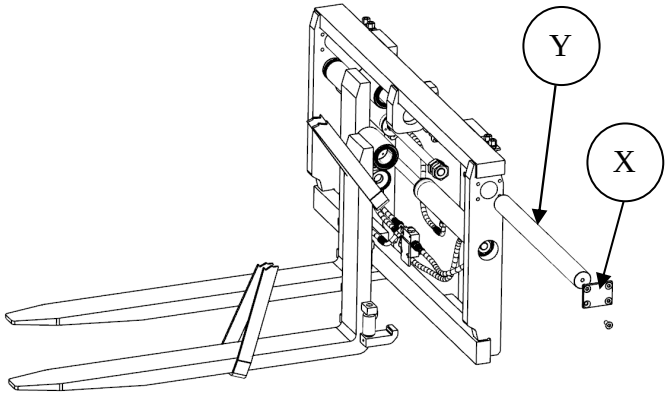


Fig.006

2.4 Mounting the protection grid (Fig.007)

2.4.1 Place the grid on plates
welded to the frame.
Bolt the grid with screws TCEI M16x50 Cl. 10.9
UNI 5931 (DIN 912) and knurled washers Ø17x24
as shown.
Tightening torque 190Nm (133 Ft/Lbs).

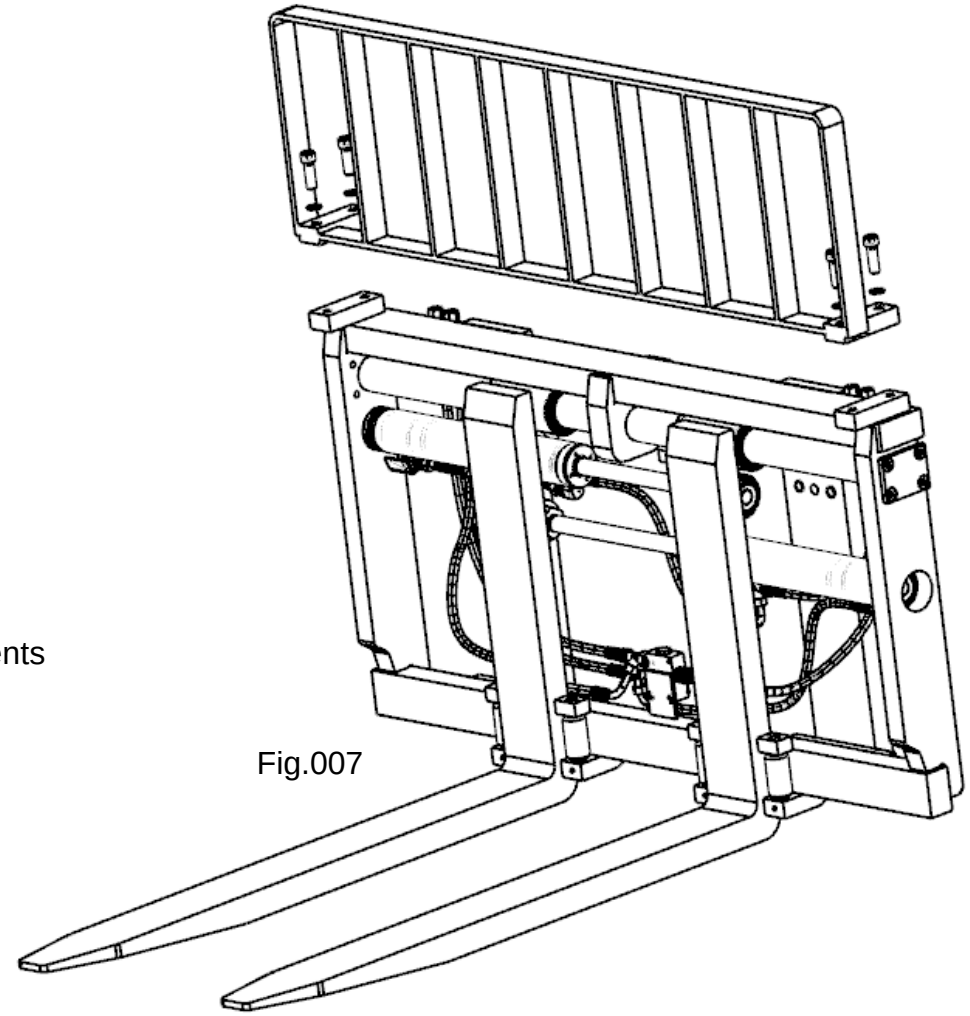


Fig.007

2.5 End test operation

After performing the procedures referred to in step 2.1, 2.2,

2.3, and if necessary 2.4 , perform some side-shifting movements
(not fork positioning movements)
up to the limit switch and keeping under pressure
for a few seconds with the maximum rated load on the forks.
Check the perfect seal of the hydraulic
connections. Any small oil leaks require
fitting disassembly and cleaning.
Tighten them according to the regulations.

3 USE INSTRUCTIONS

3.1 Checks and Recommendations

- Fork the load as centrally as possible.
- Keep the load lifted slightly from the ground to have greater stability of the truck during the movements
- When moving with the truck, keep the load tilted (lifted fork tips)
- Move the control levers gently to avoid sudden pressure drops on the hydraulic system thus compromising the load stability
- Adjust the speed of the truck based on the stability and nature of the load and any difficulties due to spaces and dimensions
- Pay attention to inclined planes and small differences in height since they limit the load stability
- Before forking, adjust the position of the forks so not to force them against the feet of the pallet

3.2 Manoeuvres to be Avoided

- Don't move loads heavier than rated load
- Don't move an unstable load
- Don't take a load on just one fork, even if it has a small weight
- Don't move a load to the side with a load on the forks;
- Don't execute sudden movements or maneuvers with load forked and raised to a high level.
- Don't perform any side-shifting or fork positioning with forked load and while the truck is moving
- Follow all the other instructions in the user manual of the truck

3.3 Prohibited Manoeuvres

- The equipment is not a gripper (do not use the forks to hold the load by opening or closing the forks)
- Don't use the equipment for any purpose it was not intended for
- Don't operate the movements control lever when the equipment is under maintenance
- Don't drive the truck when a large load impairs your visibility
- Don't tamper with the equipment
- Don't stand in the range of action of the equipment or truck
- Don't use the equipment when the structure is deformed, even minimally, or when it is not working properly
- Follow all the other instructions in the user manual of the truck

4 MAINTENANCE

4.1 Introduction

The equipment is delivered with guides lubricated with quality grease, so to ensure the normal settling and polishing of the sliding surfaces in the first period of use. The user will have to grease the bearings sliding area on the chrome bar.
The recommended lubricant is ISO X M2 (SHELL ALVANIA GREASE R2 or equivalent).
For the use of the equipment in a very dusty environment, oil ISO 32 CB (ESSO NUTO 32 or equivalent) is recommended.

The maintenance reported below relates to the proper use of the equipment in a slightly dusty environment.

4.2 Routine maintenance (Fig.008)

4.2.1 Every 1000 Working Hours.

- Check of the tightening torque of the screws in points "C2". (17 mm Allen key ; Torque 540 Nm).
- Check of the tightening torque of the screws in points "C3" (12 mm Allen key; Torque 195Nm).
- Check of the tightness of the hydraulic fittings.
- Greasing of points "g1" and "g2".
- General inspection of the equipment.
- Specific inspection of pipes condition.
  Check of the integrity of fork support rollers.

-Check of the hydraulic connections (tighten the fittings to the cylinders as necessary according to the regulations of the fittings used).
- Check of the tightness of the cylinder seals (as necessary or in presence of leaks, disassembly the cylinders according to the instructions in steps 4.3.1, 4.3.5).

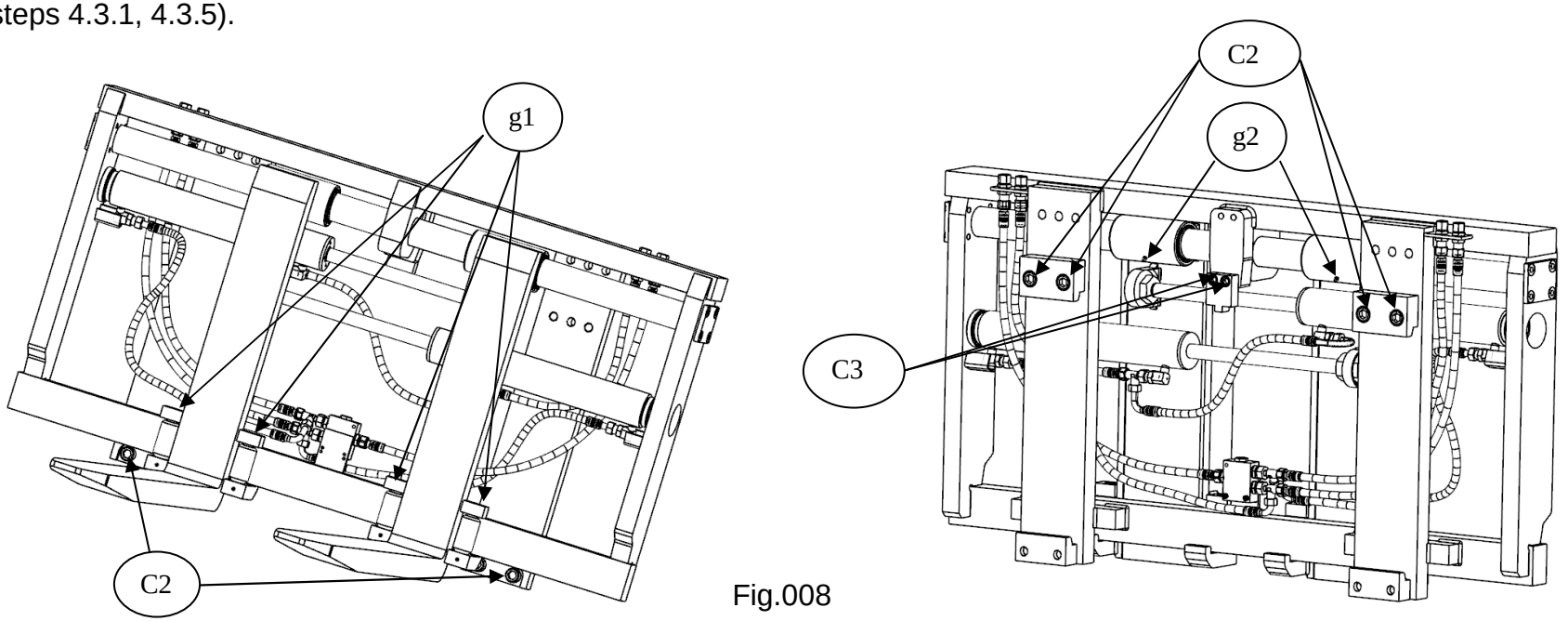


Fig.008

4.2.2 Every 2000 Working Hours

- In addition to what is described in the previous step, please perform:
-Check of the cylinder stems and the guide bushings; scratched or dented stem and scored or worn bushings, as well as excessive play to the stem (> 0.25 mm or 0.001 inc.) requires the parts replacement.

4.3 SPECIAL MAINTENANCE

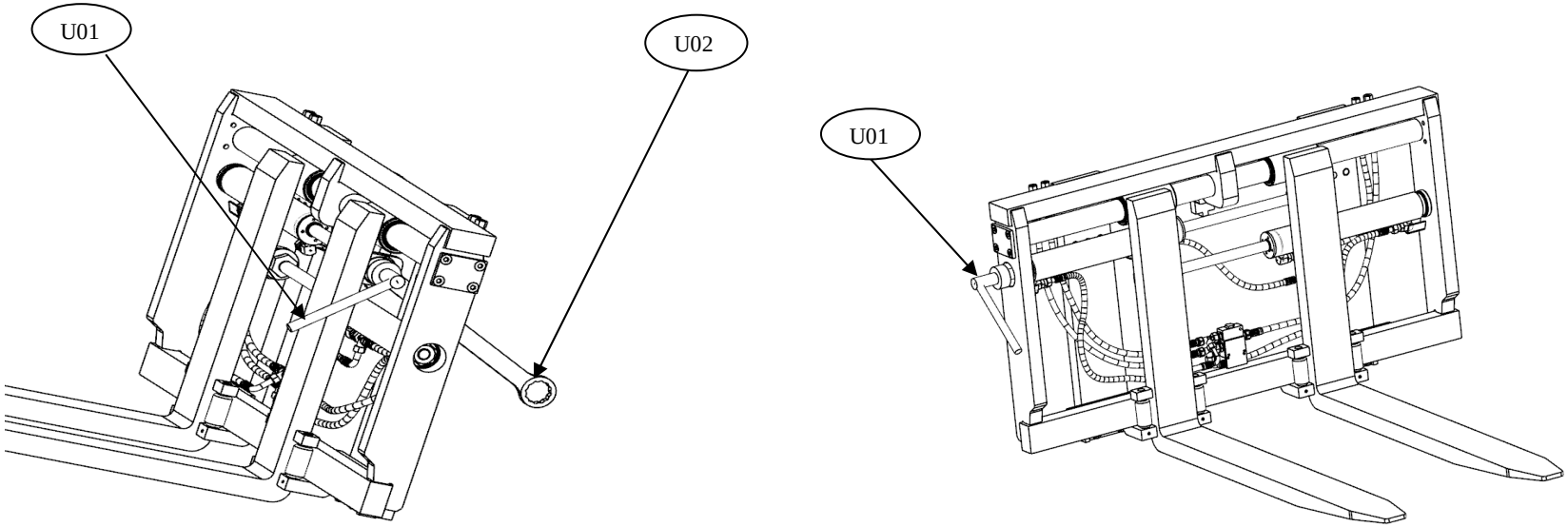


Fig 009

4.3.1 Preliminary Operations

- Before performing any maintenance, turn off the truck and release the pressure in the supply circuit.

- Ensure that during maintenance the pump and the distributor lever are not engaged.

4.3.2 Removing the right shifting fork cylinder (Fig.009)

- Remove the connecting pipes of the hydraulic circuit from the right cylinder (as seen by the truck operator) following all precautions referred to in step 4.3.1
- Holding the opposite hexagon with a fixed wrench ch60 "U02", loosen the nut with the socket wrench "U02" ch50.
- Unscrew the nut on the back with the socket wrench ch50 "U01" .
- Remove the cylinder.

To reassemble the cylinder, perform above tasks in reverse order.

4.3.3 Removing the left shifting fork cylinder (Fig.010)

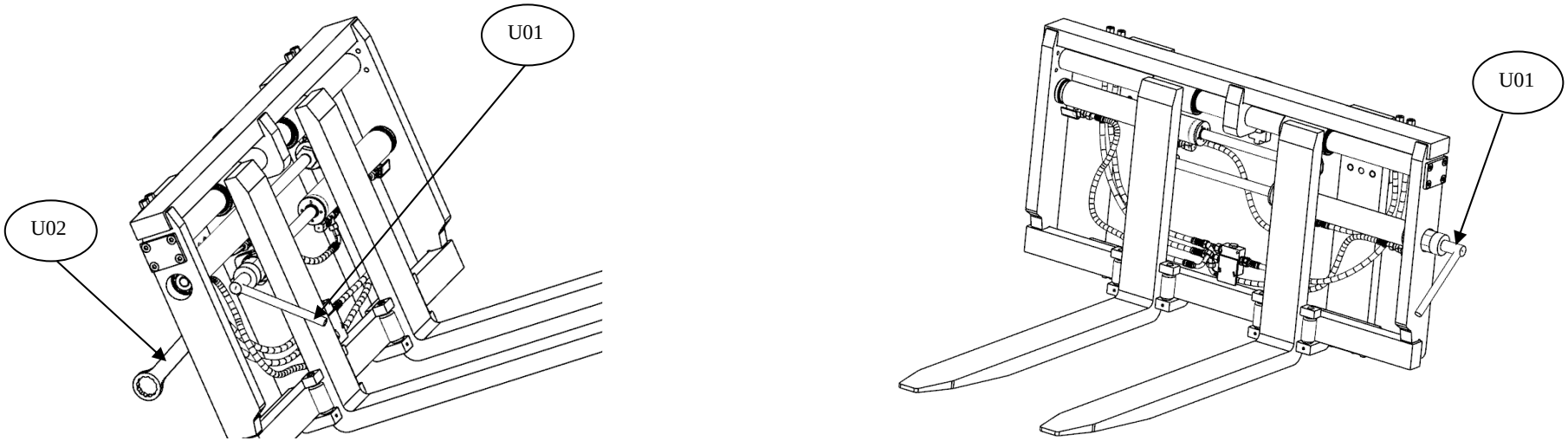
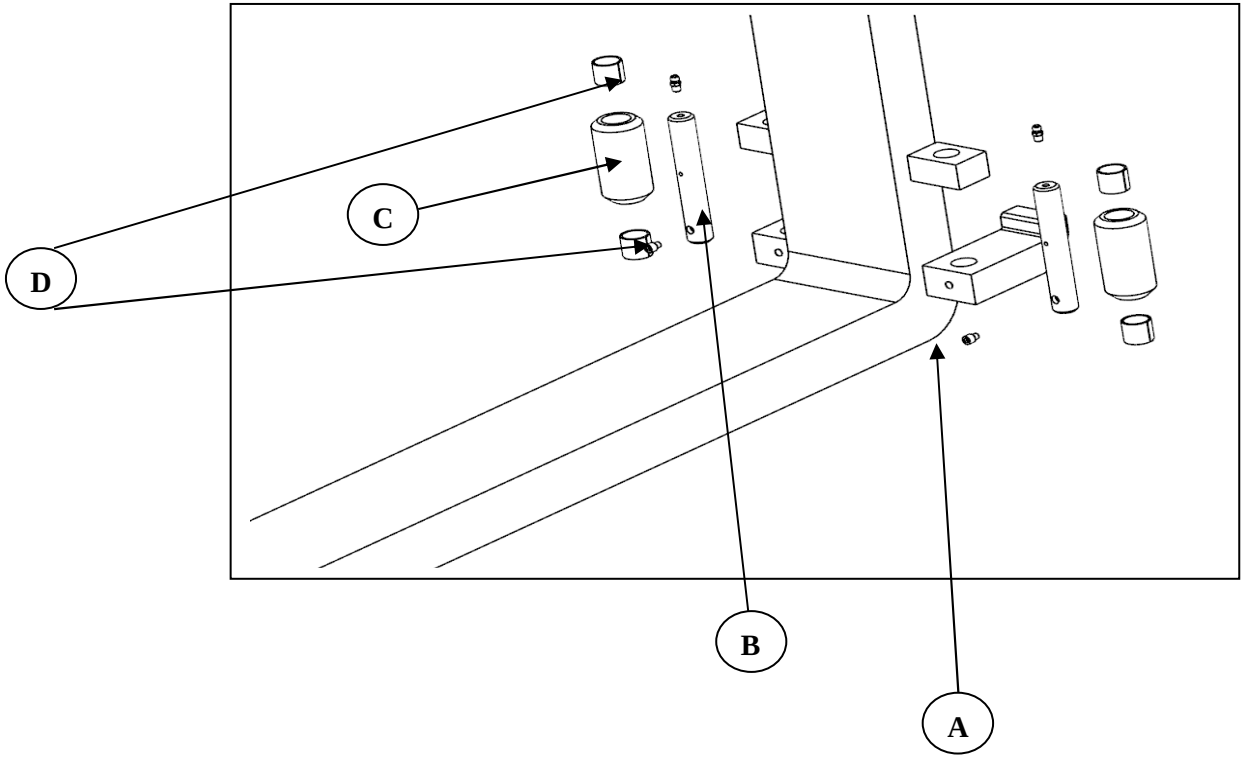


Fig.010

- Remove the connecting pipes of the hydraulic circuit from the left cylinder following all precautions referred to in step 4.3.1
- Holding the opposite hexagon with a fixed wrench ch60 "U02", loosen the nut with the socket wrench "U02" ch50.
- Unscrew the nut on the back with the socket wrench ch50 "U01" .
- Remove the cylinder.

To reassemble the cylinder, perform above tasks in reverse order.

4.3.4 Removing and installing the lower fork sliding roller



- After removing the fork (see step 2.3), loosen the grub "A" with the 4mm Allen key
- Remove the pin "B".
- Remove the roller "C" .
- Check the wear of bushings "D" and replace if necessary.
- Once thoroughly cleaned, reassemble following all above operations in reverse order.

4.3.5 Replacing the Fork-Moving Cylinder Gaskets (Fig.011)

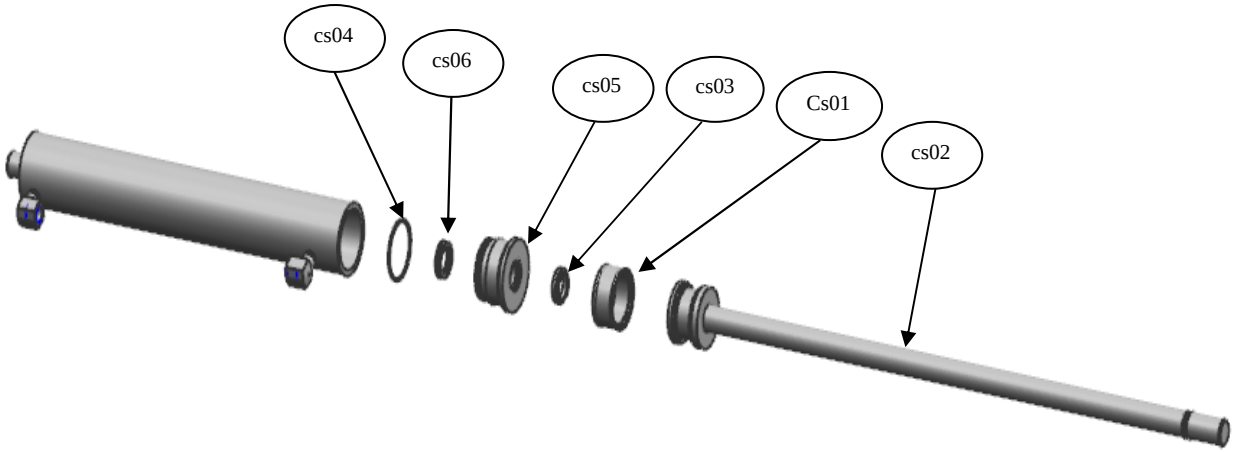
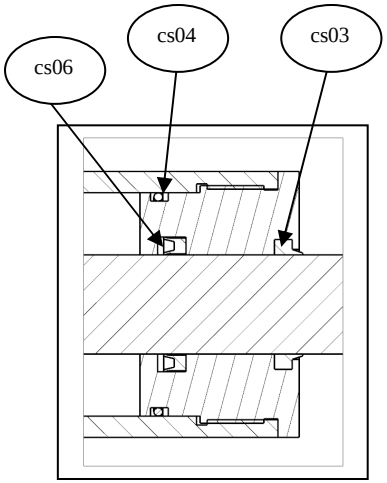


Fig.011



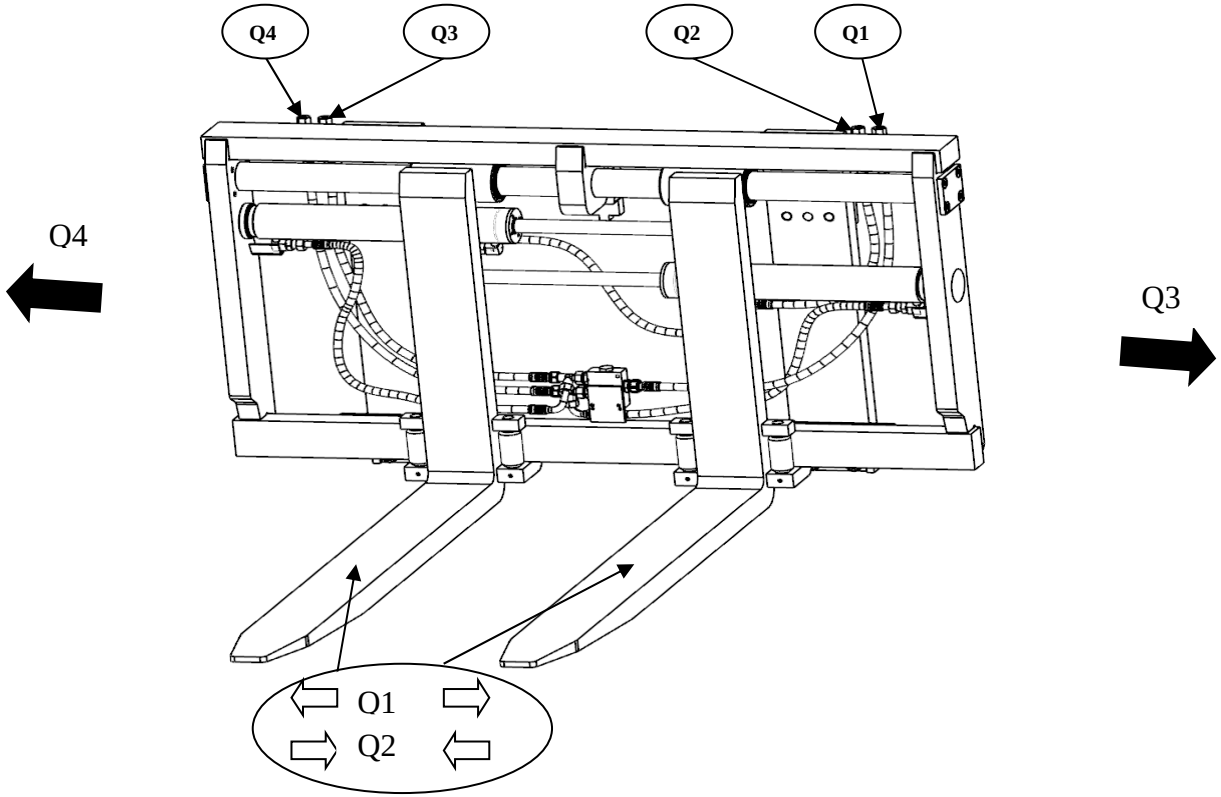
Det.”A”

- After performing one or more operations specified at point 4.3.2 and/or 4.3.3.
- Unscrew the cap "cs05", with a spanner wrench, and remove it along with the stem "cs02" as well as "CS03", "CS04" and "CS06" from the cylinder housing
- Replace gaskets “cs01”, “cs03”, “cs04”, “cs06”.
- The reassembly of the cylinder is performed following the reverse order of above operations, paying particular attention to cleaning and checking the exact orientation of the gaskets “cs03”, “cs04”, “cs06” (Det.”A”)
- The same method for gasket replacement applies to the right cylinder (as seen by the truck operator).

4.3.6 Restoring the Equipment

After any maintenance, restore the equipment to the original condition and run the tests referred to in step 2.5.

4.4 HYDRAULIC SYSTEM DIAGRAM (positioning forks) (Fig.012)



-To open the forks, apply pressure on "Q1"
-To close the forks, apply pressure on "Q2"
-Left shifting (operator side view)"Q3"
-Right shifting (operator side view)"Q4"

Hydraulic Diagram

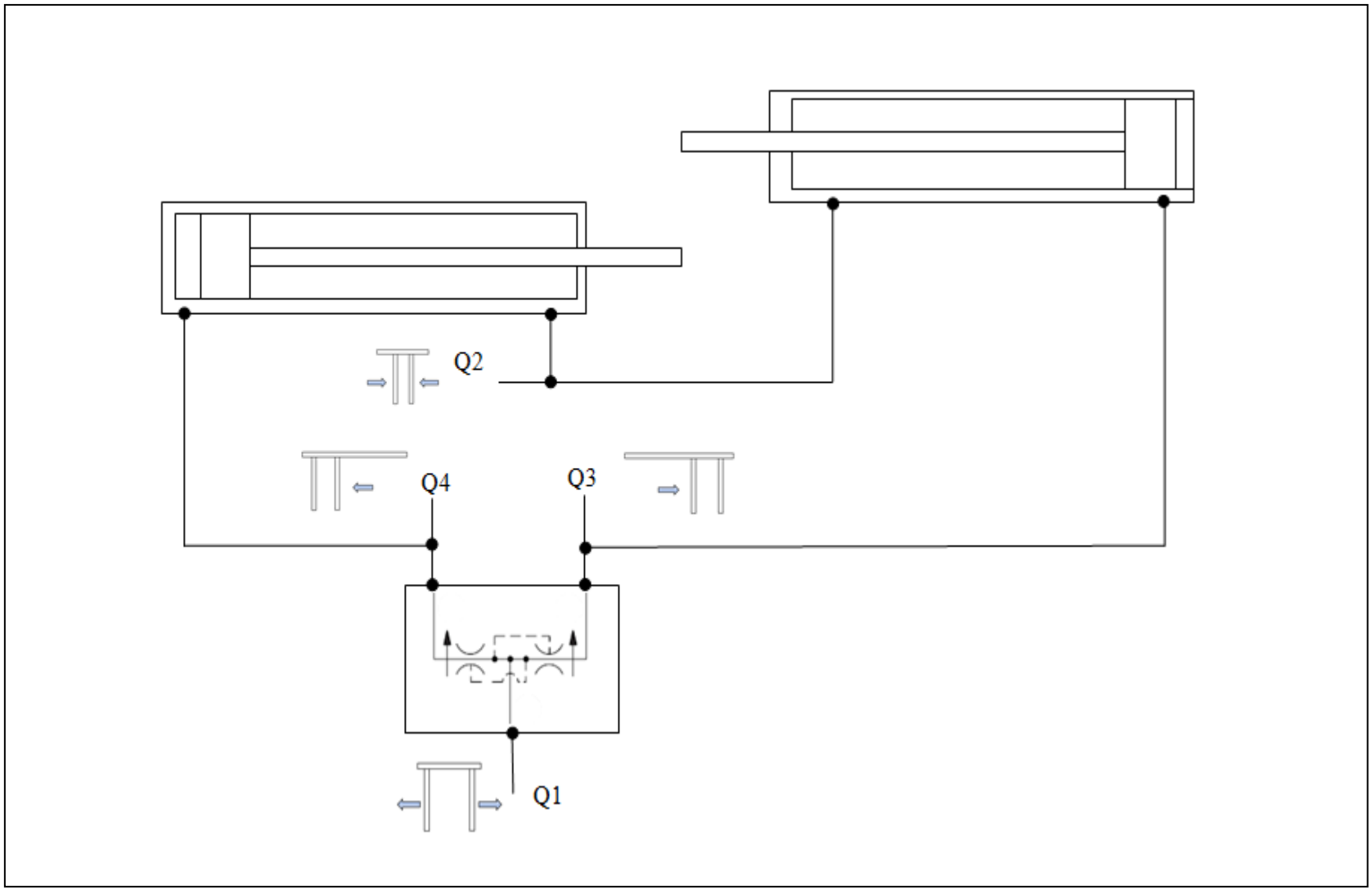


Fig.012

Table of recommended oil flow and working pressures.

- Fork positioner oil flow:

  minimum 30 l/min, recommended 40 l/min, maximum 60 l/min

- Hydraulic functions and recommended pressures:

  Fork positioner pressure min. 14 MPa
  (max pressure at distributor 25 MPa)

  shifter pressure min. 12 Mpa , max.22 MPa (max pressure at distributor 25 MPa)

5 TROUBLESHOOTING

FAULTS	CAUSES	REMEDIES
5.1 The forks do not move	There are obstacles or dirt accumulation on sliding tracks	Remove obstacles, clean and grease the sliding tracks
	Insufficient hydraulic pressure	Check and adjust the truck's pump pressure.
	Obstructions or breakage in the hydraulic circuit	Remove the obstruction or replace the damaged hose
	Internal leak in the cylinder (worn gaskets)	Check and replace the gaskets, see steps "4.3.2" and/or "4.3.3" and "4.3.5"
5.2 Forks movement occurs too slowly	Insufficient oil flow	Check and adjust the flow rate supplied from the hydraulic circuit. Adjust the truck oil flow.
	Obstructions in the hydraulic circuit	Remove the obstruction or replace the damaged hose
	Internal leak in the cylinder (worn gaskets)	Check and replace the gaskets, see steps "4.3.2" and/or "4.3.3" and "4.3.5"
5.3 Forks movement occurs too quickly	High oil flow	Check and adjust the flow rate supplied from the hydraulic circuit. Adjust the truck oil flow.
5.4 Forks movements are not synchronized	There are obstacles or dirt accumulation on sliding tracks	Remove obstacles, clean and grease the sliding tracks
5.5 Side shifting is not performed	Deformed frame	Replace the frame removing it following step 4.3.5
	Mud or other obstruction on the track of the lower rollers	Clean and lubricate the slide blocks as in step 4.2.1
	Flexible hoses deteriorated	Replace the hoses
	Obstructions in the hydraulic circuit	Remove the obstruction
	Insufficient pressure	Increase the pressure
	Pump deteriorated	Repair or replace the truck's pump

FAULTS	CAUSES	REMEDIES
5.6 Side shifting occurs too slowly	Slide rollers worn	Replace the rollers after cleaning.
	Emulsified oil, the pump sucks air	Check the oil level in the forklift's tank.
	Pump deteriorated	Repair or replace the truck's pump
	Insufficient pressure	Increase the pressure
	Air in the hydraulic system	Flush the truck system and check the oil level
5.7 Side shifting is jerky or irregular	Air in the system	Flush the plant

NOTE: If you have trouble making the repair or the problem is not listed, do not hesitate to contact BOLZONI's technical service department.

6 MATERIAL DISPOSAL

6.1 If replaced pieces are scrapped, their disposal must be differentiated depending on the nature of the material and in conformity with the law governing the disposal of solid industrial waste.

Frame assembly		**Screws, pipes and other components**	
Welded frame	*Steel*	*Pipes and fittings*	*Nylon and steel*
Supports	*Steel*	*Hydraulic oil*	*Dispose of in conformity with local law*
Fastening cylinders	*Steel*	*Bushings*	*Steel and teflon*
Chrome bar	*Steel and chrome*	*Plugs, screws, bolts, seeger rings*	*Steel*
Paint	*Polyester epoxy*	*O-ring*	*rubber*
Cylinder	*Steel and chrome*	*Gaskets*	*Polyurethane*
Shifting cylinder stems	*Steel and chrome*	*Slide blocks*	*Polyamide*

7 WARRANTY

All the products by **BOLZONI S.p.A** are provided with a 12-month warranty, when used for 8 hours per working day beginning from the date of shipment. If used for more than 8 hours per day, the warranty period will be reduced proportionally. The guarantee is limited to the replacement, FOB the BOLZONI S.p.A.'s plant of those parts the same recognises to be defective owing to material or processing faults and does not include the labour cost or transfer cost for the replacement of such part.

In case the equipment has been used inappropriately, has been placed in operation without following the instructions provided by *BOLZONI S.p.A* or if replacement parts have been installed that were not made by *BOLZONI S.p.A*, the warranty is void. *BOLZONI S.p.A* products are not guaranteed for uses beyond the performance indicated on the plates and in the documentation attached to the order.

All equipment manufactured by *BOLZONI S.p.A* is insured for damage or injury to third parties caused by defective parts or incorrect
functioning; damage or injury caused by incorrect or improper use is excluded.